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EDITOR, - - KATHARINE BRANDEGEE.

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VOL. V.

JULY, 1900.

No. 2

VOYAGE OF THE WAHLBERG.

T. S. BRANDEGEE.

The schooner Wahlberg first came into public notice when it transported a cargo of rifles from San Francisco to the Sandwich Islands; later it became a member of the guano poaching fleet that had their headquarters in San Diego and collected their cargoes from the islands west of the coast of Baja California, and during one of its trips was nearly captured by the Mexican government while lying at anchor in a small bay of the island San Martin. Finally, Mr. A. W. Anthony became owner of the vessel, intending to use it for collecting specimens of natural history from localities inaccessible except by boat. The schooner after having changed from its somewhat illegitimate to a scientific course of life seemed to be unfortunate, and now lies a wreck on the sands of Lagoon Head, drifting ashore one night when supposed to be safe at anchor. The Wahlberg in 1897, with Mr. A. W. Anthony in charge, made one memorable scientific trip, starting from San Diego in March, sailing southward, and landing at nearly all the islands west of the coast of Lower California, and continuing to Socorro, Clarion and San Benedicto.

Mr. A. L. Stockton took charge of the botanical collecting of the voyage, and I had the pleasure of accompanying the naturalists as far south as San José del Cabo, where I left the schooner, which continued on its journey to Socorro. The first insular landing was at the Todos Santos Islands, two small bodies of land, with a few outlying rocks, situated west of Ensenada and Todos Santos Bay, less than ten miles from the mainland. One of these, very much the larger, is three or four miles long, most of it elevated above the ocean two or three hundred feet, and in

some parts quite rocky. The smaller one is low and nearly level, with only a narrow strait separating it from the larger one. We were the first botanical collectors to set foot upon these islands, and entered upon our work with the eagerness of discoverers. On account of the proximity to the mainland it was supposed their flora would be the same as that of the neighboring coast, and two or three days collecting showed that this was mainly true, for only two or three strictly insular forms were seen. Seventy species of plants were collected, and doubtless more would have been found two weeks later, for the vegetation was not much advanced in the early part of March. The most common plants were *Calandrinia maritima*, *Cereus Emoryi*, *Mesembryanthemum crystallinum*, *Leptosyne maritima*, *Encelia California*, *Euphorbia misera* and *Brodiaea capitata*, all maritime plants abundant along the coast between San Diego and Ensenada. *Hosackia Watsoni*, *Verbesina dissita*, *Solanum Palmeri* and *Physalis Greenei* were the representatives of recently described and uncommon species. *Hemizonia Greeneana* was described from specimens collected on Guadalupe Island, which until now has been its only known habitat, and it was interesting to find this frutescent *Hemizonia* growing so plentifully over the larger of the Todos Santos Islands. The only other representatives of the insular flora found, and these not in abundance, were *Eschscholtzia ramosa*, an inhabitant of many other islands also and a *Perityle*. A few plants deserving of mention were *Malvastrum exile*, *Aplopappus Berberidis*, *Franseria chenopodifolia*, *Sonchus tenerrimus*, *Phacelia ixodes*, *Atriplex julacea*. No trees grow upon these islands, and the only bushes of any size were *Rhus laurina* and *R. integrifolia*, generally alluded to in the publications of the coast surveys as "scrub oak."

The next landing was at San Martin, a small island situated west of San Quintin, in plain view from the Peninsula. It consists mainly of an old volcanic cone, four or five hundred feet high, having a well-formed crater, nearly one hundred feet deep, with the slopes toward the ocean covered with broken rock, over which near the base the sands have drifted. The guano poachers consider it a barren island and so it usually is, but our visit hap-

pened after abundant rains, and forty species of plants were found along the beach and among the rocks. The species of *Rhus* were absent, and the tallest forms of vegetation were a few plants of *Cereus gummosus* and *C. Cochal*. The only insular plants found were *Eschscholtzia ramosa* and *Perityle Grayi*. Others, growing also on the mainland and deserving of mention, were *Hosackia Watsoni*, *Perityle rotundifolia*, *Franseria bipinnatifida*, its most southern known habitat, *Senecio Lyoni*, found first on Santa Catalina, *Phacelia ixodes* and *P. Parryi*. *Mesembryanthemum crystallinum*, *Encelia Californica*, *Amblyopappus pusillus*, *Leptosyne maritima*, *Sonchus tenerimus*, *Euphorbia misera* and other vegetation common to these northern Mexican islands were abundant.

Sailing southward the next island on the route was San Geronimo, or Round Island, as it is often called. This island is scarcely a mile long. The highest part is about a hundred feet above the ocean, and most of it is much lower. Innumerable sea-birds make their home here, and the only human visitors are the guano hunters. The scant vegetation is prostrated by the winds that blow the sand about and almost bury it. Like Todos Santos and San Martin, there is no fresh water, and the vegetation depends upon frequent fogs and uncertain rains, for moisture. Only the following four species of flowering plants grow upon the island: *Lavatera venosa*, a few plants—hitherto this showy malvaceous shrub has been supposed to be endemic on the San Benito Islands, and probably seeds carried by birds colonized them here—the other three plants are: *Mesembryanthemum crystallinum*, *Lycium Richii* and a species of *Suaeda*.

From San Geronimo a long sail westward brought us to Guadalupe Island, that place most interesting to all naturalists. The flora of this island is quite well known, having been collected by several botanists, who have written much concerning it. At this time the vegetation was very rank and green, but not as far advanced as that of the islands nearer the coast we had just visited. Most of the plants were not in blossom, and only at the lowest elevations was it possible to find them suitable for specimens.

The most interesting part of the flora is confined to the cliffs,

out of reach of the goats, and it is to be supposed that a botanist who could have reached this island before these animals, would have discovered many plants that must now always remain unknown, because they did not find an asylum on an inaccessible rock.

But goats are not the only exterminators of endemic species, for I searched in vain for *Hesperelæa* at the exact locality where Dr. Palmer found it, and could only find a goat corral made from trees chopped down in the vicinity.

The following list contains names of plants not previously reported from the island :

Platystemon Californicus Benth. A recent introduction.

Calandrinia maritima, Nutt.

Microseris Lindleyi Gray.

Bæria coronaria Gray. A recent introduction about the usual landing.

Bæria gracilis Gray. Also recently introduced.

Amsinckia intermedia F. & M.

Orthocarpus purpurascens Benth. Introduced.

Brodicea lugens (Greene). Common along the slopes of Sparmann's cañon.

Aphanisma blitoides Nutt.

Phalaris intermedia Bosc.

The flora of the three small islands known as the San Benito Islands had previously been collected by Dr. Palmer* and Lieut. Pond,† who found twenty-five species. The endemic species *Lavatera venosa*, *Hemizonia Streetsii* and *Mamillaria Palmeri* are very abundant. The following additions to published lists are the result of a week's search at a time when plenty of rain had brought forth an abundance of plants :

Oligomeris subulata Bois.

Phaseolus filiformis Benth.

Petalonyx linearis Greene.

Mentzelia involucrata Watson.

Malvastrum exile Gray.

Opuntia tessellata Engelm.

Opuntia prolifera Engelm.

* Cont. U. S. Herb. 1, 9.

† Pitt. 1, 263.

Cereus Schottii Engelm.

Perityle aurea Rose.

Perityle Grayi Rose.

Sonchus tenerrimus L.

Cuscuta sp.

Aphanisma blitoides Nutt.

Atriplex Coulteri Dietrich.

Agave Shawii Engelm. Many plants were in full bloom. Dr. Palmer notes the presence of two Agaves, but it seems that this is the only species and that the spines of the leaf are very variable. *A. Sebastiania* Greene of Cedros Island is the same. This is the common Agave of the western coast of Baja California, between Santa Domingo and San Diego.

From the San Benitos to Cedros Island is an afternoon sail with a good wind. Several collectors have visited Cedros, but as it is a large island no one has searched it perfectly. At this time the vegetation of the northern portion was as green and abundant as possible for this region, but the southern part had received a smaller rainfall and was very dry. The plants of the following list were collected, and have not before been reported from the island :

Delphinium cardinale Hook.

Capsella Bursa-pastoris Moench.

Thysanocarpus laciniatus Nutt.

Athysanus pusillus Greene.

Calandrinia maritima Nutt.

Silene Gallica L.

Ribes viburnifolium Gray.

Ribes tortuosum Benth.

Malva borealis Wallm.

Erodium cicutarium L'Her.

Mentzelia involucrata Watson.

Cereus maritimus M. E. Jones.

Cereus gummosus Engelm.

Mesembryanthemum crystallinum L.

Lonicera hispidula subspicata H. & A.

Bowlesia lobata, R. & P.

Galium aparine Vaill.

Bæria gracilis Gray.

Gnaphalium sp.

Gilia uncialis Brandg. n. sp. ined.

Gilia gracilis Hook.

Datura discolor Bernh.

Salvia Columbariæ Benth.

Amsinckia intermedia F. & M.

Chenopodium album L.

Eriogonum intricatum Benth.

Euphorbia polycarpa Benth.

Argythamnia Californica Benth.

Brodiaea capitata Benth.

Typha latifolia L.

Gymnogramme triangularis Kaulf.

Between Cedros and San Bartolomé Bay lies the island of Natividad. Previously it had been visited by no botanical collector. It is much smaller than Cedros, and the highest elevation, about five hundred feet, is not to be compared with the mountains of that island. There is no fresh water upon it, so

that a resident band of goats must often satisfy their thirst by eating succulent plants, and have already nearly exterminated the *Cotyledons*. There are no trees, but a few small bushes of *Veatchia* are found and a dozen specimens of *Cereus Pringlei*, ten to fifteen feet high, are scattered about. The vegetation is scant and the general appearance of the island is barren. Most of the plants grow also upon *Cedros*, and these, with a few belonging to San Bartolomé Bay, constitute its entire flora, for there is not an endemic species. The rainfall of the season had been even less than that of the southern end of *Cedros*, consequently the annuals were small and few in number, and the collection not as large as it would have been at a more favorable time. The following list contains names of the plants found upon the island:

<i>Thelypodium lasiophyllum</i> Greene.	<i>Leptosyne involuta</i> (Greene).
<i>Lepidium lasiocarpum</i> Nutt.	<i>Franseria chenopodifolia</i> Benth.
<i>Oligomeris subulata</i> Boiss.	<i>Viguiera lanata</i> Gray.
<i>Cotyledon</i> sp.	<i>Sonchus tenerrimus</i> L.
<i>Eschscholtzia ramosa</i> Greene.	<i>Chænactis lacera</i> Greene.
<i>Malvastrum exile</i> Gray.	<i>Phacelia Cedrosensis</i> Rose.
<i>Calandrinia maritima</i> Nutt.	<i>Nicotiana Clevelandi</i> Gray.
<i>Veatchia discolor</i> (Benth.)	<i>Lycium</i> sp.
<i>Frankenia Palmeri</i> Watson.	<i>Krynitzkia maritima</i> Greene.
<i>Mentzelia involucrata</i> Watson	<i>Plantago Patagonica</i> Jacq.
<i>Mesembryanthemum crystallinum</i> L.	<i>Mirabilis lævis</i> (Benth.)
<i>Mamillaria dioica</i> Brandg.	<i>Chenodium murale</i> L.
<i>Mamillaria Pondii</i> Greene.	<i>Aphanisma blitoides</i> Nutt.
<i>Echinoeactus</i> sp.	<i>Atriplex Coulteri</i> Dietrich.
<i>Cereus Pringlei</i> Watson.	<i>Atriplex julacea</i> Watson.
<i>Cereus maritimus</i> M. E. Jones.	<i>Suæda</i> sp.
<i>Opuntia prolifera</i> Engelm.	<i>Euphorbia misera</i> Benth.
<i>Opuntia tessellata</i> Engelm.	<i>Euphorbia polycarpa</i> Benth.
<i>Bebbia juncea</i> Greene.	<i>Agave Shawii</i> Engelm.
<i>Amblyopappus pusillus</i> H & A.	

From Natividad to San Bartolomé Bay is a distance of about twenty miles, and here a landing was made on the mainland of the Peninsula. In 1839, H. M. S. *Sulphur* anchored in this harbor, and the plants found at that time are listed in the Botany of the *Sulphur*. In 1889 Lieut. Pond, of the U. S. ship *Ranger* also collected some plants in the vicinity. Forms from

these two collections have been described as new. These I had hoped to see, and was much disappointed to find the region was perfectly dry and seemed not to have been rained upon for years. The only green vegetation were the *Suædas* and *Lyciums*, growing in the brackish soil, and the only bright color visible was that of the few straggling scarlet blossoms of *Fouquieria*. A few plants were recognized that were before known only from Cedros Island, and made it evident that an accurate knowledge of the distribution of the neighboring island forms cannot be obtained without a more thorough examination of the adjacent mainland. *Dalea Benthami*, found hitherto only on Cedros and Santa Margarita Islands, is common in the sandy gulches running into the bay, and it was seen again on the coast near Asuncion Island. *Rhus Lentii* is not uncommon in the cañons, and was also found about San Pablo Bay; its only habitat was supposed to be Cedros Id. *Viguiera lanata* is found on the rocky hills about the entrance to the harbor; it is a common plant on Natividad and Cedros Islands. *Lavatera venosa* grows upon a rock at the mouth of the harbor, and surrounded by water is preserved from destruction by animals that would like to feed upon it. The distribution of the *Lavateras* of these Mexican islands is very interesting. *Lavatera venosa* is extremely abundant on the San Benito Islands, and grows on San Geronimo Islands and at San Bartolomé Bay. The leaves of the San Bartolomé form are more laciniate than those from San Benito, and this peculiarity would seem to show that it is not a recent introduction from the latter. *L. occidentalis* persists on the cliffs of the cañons of Guadalupe Island, in localities inaccessible to goats, and *L. insularis* belongs exclusively to the Coronado Islands near San Diego. *L. insularis* and *L. occidentalis* are not very distinct from one another. These three species thrive well in cultivation at San Diego and spread rapidly, but it is difficult to be certain whether many of the young plants belong to the Guadalupe or the Coronados forms, perhaps a result of cross-fertilization. Herbivorous animals are fond of *Lavatera*, and the presence of goats on Natividad would account for its absence there; and on Cedros in addition to these animals, so destructive to botanical interests, there are deer

and rabbits, which would certainly destroy it in all places accessible to them. On San Benito, San Geronimo and Coronado Islands there are no goats to exterminate it. On Guadalupe they have already destroyed all within their reach, and on the islands off the coast of Alta California, like the sea-birds, it inhabits outlying rocks. But why is the genus not represented in the flora of San Martin, where conditions would seem to be suitable for it?

San Roque is a very small, low island, perhaps a mile long, situated near the mainland, and about latitude 27° N. It is the home of quantities of sea-birds, and there is no vegetation upon it except a patch of *Heliotropium Curassavicum*. Asuncion Island, ten miles from San Roque and similarly situated, is a still smaller islet; its flora is only *Encelia laciniata* and an undetermined *Lycium*.

From these islands the schooner went directly to San José del Cabo, a town situated at the extreme southern end of the Peninsula. No stop was made at Magdalena or Santa Margarita Islands, to the disappointment of the botanists, but in reality nothing would have been gained, for later, on my return by steamer, I landed at Magdalena Bay and learned that there had been no rain for two or three years, and saw that even the perennials were leafless.

Guadalupe has a more northern flora than any other of the Mexican islands, on account of its position with respect to the ocean currents and the prevalence of fogs; its springtime at the time of my visit was a month later than that of San Diego and the Todos Santos Islands, and far behind that of San Benito and Cedros. The wind often drifts fogs over the high northern headlands of the large islands of Cedros and Guadalupe when the lower portions are warmed by the sun, and in consequence there is a difference between the floras of the two ends. The growth of pines, cypress and juniper at the north, and their absence from the south, are the most evident results of different conditions.

The Revillagigedo group were visited in 1889 by the U. S. Fish Commission vessel *Albatross*. At that time some plants

were collected by Mr. Charles H. Townsend, and an account of them and the islands has been published.* With additional plants, Messrs. Anthony and Stockton found again those collected by Mr. Townsend, and the following lists contain names of all plants as yet brought from these isolated islands.

SAN BENEDICTO ISLAND.

- | | |
|-------------------------------------|------------------------------------|
| <i>Perityle Socorrensis</i> V. & R. | <i>Cenchrus myosuroides</i> H B K. |
| <i>Aristolochia brevipes</i> Benth. | <i>Fimbristylis</i> sp. |
| <i>Euphorbia Anthonyi</i> Brandg. | |

CLARION ISLAND.

- | | |
|--------------------------------------|---------------------------------------|
| <i>Lepidium lasiocarpum</i> Nutt. | <i>Zanthoxylon Plerota</i> HBK. |
| <i>Portulaca pilosa</i> L. | <i>Opuntia (Platopuntia)</i> sp. |
| <i>Sesuvium Portulacastrum</i> L. | <i>Brickellia</i> sp. |
| <i>Waltheria Americana</i> L. | <i>Perityle Socorrensis</i> , V. & R. |
| <i>Melochia pyramidata</i> L. | <i>Cressa Cretica</i> , L. |
| <i>Tribulus cistoides</i> L. | <i>Spermacoce</i> sp. |
| <i>Dodonæa viscosa</i> L. | <i>Physalis æquata</i> Jacq. |
| <i>Sapindus</i> sp. | <i>Ipomœa cathartica</i> Poir. |
| <i>Erythrina</i> sp. | <i>Teucrium Townsendii</i> V. & R. |
| <i>Canavallia obtusifolia</i> DC. | <i>Euphorbia Clarionensis</i> Brandg. |
| <i>Phaseolus</i> sp. | <i>Euphorbia Californica</i> Benth. |
| <i>Cæsalpinia Bonducella</i> Roxb. | <i>Fimbristylis</i> sp. |
| <i>Sophora tomentosa</i> L. | <i>Tradescantia</i> sp. |
| <i>Karwinskia Humboldtiana</i> Zucc. | |

SOCORRO ISLAND.

- | | |
|---------------------------------------|-------------------------------------|
| <i>Portulaca pilosa</i> L. | <i>Nicotiana Stocktoni</i> Brandg. |
| <i>Tribulus cistoides</i> L. | <i>Spermacoce</i> sp. |
| <i>Waltheria Americana</i> L. | <i>Cordia Socorrensis</i> Brandg. |
| <i>Triumfetta Socorrensis</i> Brandg. | <i>Heliotropium Curassavicum</i> L. |
| <i>Gossypium Barbadosense</i> L. ? | <i>Lantana involucrata</i> L. |
| <i>Cardiospermum Palmeri</i> V. & R. | <i>Teucrium affine</i> Brandg. |
| <i>Dodonæa viscosa</i> L. | <i>Bumelia</i> sp. |
| <i>Calliandra</i> , two species. | <i>Elytraria tridentata</i> Vahl. |
| <i>Rhynchosia minima</i> DC. | <i>Bærrhaavia</i> sp. |
| <i>Conocarpus erecta</i> L. | <i>Aristolochia brevipes</i> Benth. |
| <i>Zanthoxylon</i> sp. | <i>Phoradendron rubrum</i> Griseb. |
| <i>Brickellia</i> sp. | <i>Acalypha umbrosa</i> Brandg. |
| <i>Erigeron Socorrensis</i> Brandg. | <i>Croton</i> sp. |
| <i>Vernonia littoralis</i> Brandg. | <i>Euphorbia incerta</i> Brandg. |

* Proc. Am. Museum, xiii, 145.

Leptosyne insularis Brandg.
Viguiera deltoidea Townsendii
 V. & R.
Perityle Socorrensis V. & R.
Scævola Plumieri L.
Physalis glabra Benth. ?
Cestrum Pacificum Brandg.

Hippomane Mancinella L.
Ficus Tecolutensis Miq. ?
Fimbristylis sp.
Cenchrus myosuroides HBK.
Heteropogon contortus R. & S.
Cheilanthes Wrightii Hook.

Several fragmentary specimens of other plants were collected, mostly in fruit, of which the genus is uncertain. From even these small collections of the much larger but still unknown flora of these islands is shown something of that insular variation noted by Drs. Robinson and Greenman in the plants of the Galapagos Islands, esdecially in regard to *Euphorbia viminea*.* *Euphorbia Anthonyi*, of San Benedicto, has a very closely related species, *E. Clarionensis* upon Clarion and Socorro and *Teucrium Townsendii* of Clarion has an extremely near relative upon Socorro.

AQUILEGIA EXIMIA.

ALICE EASTWOOD.

My attention has been recently called to this suppressed species of *Aquilegia* by the discovery, July first of this year, of many plants in one of the branches of San Anselmo Creek in Marin County. Several years ago I had noticed a single plant of the same species along the banks of Lagunitas Creek near the mouth of the Big Carson Creek. Mrs. Ella Gibbons Sharpe last year brought me a specimen which she had collected in the same locality and had noticed as conspicuously different from the species common everywhere in thickets and along shady banks (No.370).

A study of all these specimens has convinced me that in this *Aquilegia* we have a species quite distinct from any to which it is allied or under which it may have been placed. Its apparent rarity is probably the reason why it has been obscure for so long a time and why it has been considered a form of or identical with *A. truncata* F. & M.

* Am. Journal Science, Vol. L. 135.

It is always found growing near water along the banks or in the beds of rocky streams and blooms at least a month after the other species. It is very viscid pubescent throughout, except on the flowers. The plants are large and the leaves are mostly densely clustered on the short stems which form clumps. The flowering stems are sparsely leaved, indeed almost naked, widely branching, and rise to a height of 2-3 feet above the leafy base. The flowers are broader than long, with sepals reflexed and widely spreading, about as long as the spurs. The spurs are concave, more than half an inch across at the top and taper to the base of the globular nectaries. In the buds the spurs diverge instead of conniving as do all the other allied species. The genitalia are as long as the petals, with filaments filiform, anthers oblong and styles almost equaling the filaments. The leaves are on long petioles about a foot in length and have much coarser and larger divisions than the other species. The beautiful figure illustrating the type shows the leaf and a branch having three flowers, identical with the specimens from Marin County. It is the most showy, elegant and largest flowered of all the red-flowered species of *Aquilegia*.

In the Herbarium of the California Academy of Sciences there is a specimen of this species collected by T. S. Brandegee on Mt. Hanna, Lake County, June 27, 1884 (No. 368), and another one also from Lake County collected by J. W. Blankinship on the North Fork of Caché Creek, July 5, 1893 (No. 367). There is a specimen in fruit which I take to be the same species collected by the author in San Emidio Cañon, Kern County, October 1, 1894 (No. 425).

A. eximia has also been compared with *A. Californica* Lindl. Gard. Chron. 1854, 836. A drawing of this species is published which gives a branch with flower and bud. The bud has connivent spurs which at once distinguish it from *A. eximia*. Besides, there is a distinct rounded lamina, more marked than in *A. truncata* but not so noticeable as in *A. formosa*. It however seems more closely allied to *A. formosa* than to *A. truncata*. The discovery of the type may reestablish this species as distinct, though it seems doubtful.

I append the original descriptions of *A. eximia* and *A. truncata*.

AQUILEGIA EXIMIA Planch, Fl. Serres, XII. 13, t. 1188. *A. tota*, flore excepta, viscoso-puberula, foliis biternatis segmentis tripartitis v. trilobis inciso-dentatis, floribus longe pedunculatis cernuis aurantiacis, sepalis lanceolatis reflexis, petalorum limbo brevissimo integro, calcare recto quam sepala paulo longiore stylis stamina superantibus.

The type was raised from seed in the establishment of Van Houtt at Ghent, Belgium. It flowered for the first time in 1856. The author, in the notes following the description, likens the flower to a crown with ten points surmounted with five gems. These gems are the little spherical honey glands which terminate each horn.

AQUILEGIA TRUNCATA Fisch. & Meyer, Linnæa 18, 206, transcribed from Ind. Sem. Hort. Petrop. ix. 1843, Suppl. 8.

A. calcaribus rectis sepalorum longitudine; sepalis oblongo-lanceolatis patentissimis; nectariis fauce truncatis: limbo (petalo DC) nullo! genitalibus longissime exsertis: antheris ellipticis: capsulis 5 pubescentibus. Species e serie *A. Canadensis*, *formosae*, *Skinneri* et *coeruleae*, nectariis ad faucem truncatis, limbo (petalo) omnino nullo ab omnibus *Aquilegiæ* speciebus diversa; differt præterea ab *A. Canadensi*, cui proxima, et ab *A. Skinneri* calcaribus brevioribus et sepalis patentissimis; ab *A. formosa* sepalis multo minoribus, genitalibus longissime exsertis et antheris ellipticis (in illa linearibus).

Habitu, pubescentia minuta tenui et foliis cum *A. Canadensi* convenit. Flores sordide coccinei unicolores. Sepala *A. Canadensis* patentissima, unicolora vel apice subdiscolora, 8 lin. circ. longa. Nectaria (calcaria) $8\frac{1}{2}$ lin. longa, quam in *A. Canadensi* crassiora, recta, apice incrassata, ad faucem sub angulo recto truncata. Stamina stylorum longitudine. Antheræ breves, ellipticæ. Hab. in California, prope coloniam Ross.

NOTES ON CACTEÆ III.

KATHARINE BRANDEGEE.

Mamillaria (Coryphantha) Nickelsæ. Soon and densely cæspitose, glaucous and often purplish, 4–6 cm. high, hemispherical or globose; tubercles 10–12 mm. long, becoming quite as broad and imbricated; spines 14–18 all radial, slender, at first yellowish with darker tips, later all gray; lower spines 8–10 mm. long, the upper $\frac{1}{3}$ longer, stouter, extending into the groove and forming a fascicle, the clustered fascicles making an upright tuft at the vertex; flowers 5–7 cm. in full expansion, said to be bright yellow with red center; fruit unknown.

Southward from Laredo, Texas. Named for the collector, Mrs. Anna B. Nickels, and offered in catalogues as *M. Nickelsii*. Evidently closely related to *M. sulcata* Engelm.

M. (Eumamillaria) Mainæ. Hemispherical to ovate, simple, or sparingly branched from the base, reaching a height of 10 cm.; tubercles glaucous, somewhat incurved, cylindric, becoming conical, 1–1½ cm. long, often bright red in the naked axils; radial spines, 10–15, yellowish, becoming white, slender, scarcely pungent, 6–10 mm. long, the upper rather the shorter; centrals 1–2, both hooked, rarely an additional upper one; lower central, usually the only one, nearly twice as long as the radials, stout and strongly hooked, porrect, brown below, blackish above, somewhat twisted; the second central when present, widely divaricate, ascending, weaker and shorter: flowers in crown at upper part of stem, pinkish-white or flesh-color, 1–1½ cm. in length, including the ovary; style whitish, deeply, few-lobed; fruit red, globular to obovate, shorter than the tubercles; seeds dull-black, punctate, a little more than 1 mm. long, obovate, with narrowly-linear basal hilum.

Named for the collector, Mrs. F. M. Main, who found it in Sonora, south of Nogales.

It has been offered by dealers as *M. Galeottii* Scheid, to which it is not at all related.

M. Purpusii Schum. M. f. K. iv. 165 (abb.), and Monog. Cact. 547, is certainly *Echinocactus Simpsoni* Engelm. The variety first

indicated, *M. Spaethiana* Schum, answers to one of the forms of var. *minor* Engelm. *M. Spaethiana* has been sent to me from Germany, and examination shows the rather large fruiting areolæ contiguous to the spines and the characteristic seeds of *E. Simpsoni*.

Echinocereus Straussiana Quehl. M. f. K. x. 70 appears to be only *E. viridiflorus* var. *cylindricus* Engelm., *Cereus viridiflorus tubulosus* Coulter.

PERESKIA ACULEATA Mill, commonly known as "Blad apple" or "Barbadoes gooseberry," is a familiar and widely cultivated cactus, but the fruit seems nevertheless very little known, as Dr. Schumann, in Monog. Cact. 760, describes it as "round, spiny and scaly, of the size of a gooseberry, green. Seeds 3-5, compressed, oblong."

P. aculeata, in San Diego, flowers and fruits in the open air, requiring no protection, though the fruit is more abundant when the plant is screened from the sea winds. It flowers from September to November, ripening its fruits in the Spring. The ovary is leafy, with small bristly spines and some hairs in the axils, but the mature fruit is nearly smooth, 2-3 cm. long, 1½-2 cm. thick, deep, somewhat translucent, lemon-yellow. The terminal scales of the ovary persist as fleshy infolded lobes entirely concealing the lower part of the withered flower, something in the manner of *Pereskia Poeppigii* (Monog. Cact., fig. 108 C.), but the points are so completely infolded that at first glance the berry seems only dimpled at the top. The berry is yellow throughout, the contents of the ovary proper being of a softer, more jelly-like consistence. The seeds (commonly only one) are nearly circular in outline, about 8 mm. broad, dark-brown, minutely rugose, thin, concavo-convex, the convex side outward, erect, with transverse basal hilum. Embryo forming the larger part of a ring, the lower part of the accumbent, foliaceous, unequal cotyledons received into the flange of a spool-like endosperm.

The following description of a new species of Echinocactus is extracted from a paper by Dr. Weber, published in Bull. Mus. Hist. Nat., Paris, April, 1898. The notes concerning *E. Califor-*

nicus and *E. acanthodes* are translated and condensed from the same paper, every contribution to the knowledge of synonymy being of much value.

No such plant as the one described under *C. Californicus* is known from Baja California, but it may prove to belong to some one of the forms now aggregated under *C. Emoryi*. Although Dr. Weber describes his plant as "adult" it is known that the spines often increase in number with age long after arriving at the flowering stage. Plants cultivated from seeds would soon attain a very much greater size than one of the same number of years subjected to the hard conditions of its native home, consequently two plants of the same size may have a very different spine character.

"ECHINOCACTUS DIGUETI n sp. (Fig. 1) *E. elongatus*, dein cylindricus, columnaris, crassissimus, maximus; costis numerosis (34) angustis; sinubus profundis acutis; vertice impresso; areolis junioribus tomentosis; aculeis 6-7 aequalibus, gracilibus acicularibus, subarcuatis, flavescentibus, exterioribus 5-6, centrali 1; floribus flavidis, tubo glabro squamato.

The spines are 1 central, 1 lower, 4 lateral and sometimes an upper one—all slender, acicular, nearly equal, 3-4 cm. long, straight, not annulate. The fruit is not known.

According to the photographs this Echinocactus is generally 1, 2, or even 3 m. in height, by a diameter of 40, 50, or even 80 cm. Some examples of old plants, however, reach a height of 4 m., which surpasses any other species known. The photograph (fig. 1) shows that a man with upraised hand is only able to reach half the height of one of the plants.

This curious Echinocactus was discovered by M. Diguët in the Catalana Island (upon most of the charts this island is called Catalina, but according to M. Diguët its true name is Catalana) situated in the Gulf of California, about 25° of latitude, and frequented by the pearl fishers.

ECHINOCACTUS CALIFORNICUS Monv. This species, mentioned first in Monville's Catalogue, 1846, was well known and sufficiently distributed in France fifty years ago. It was raised about

1840 by M. Dumesnil, at Havre, from seeds brought by a ship captain from Baja California. It was a mistake of Engelmann, upon false information, to give it as a synonym of *E. viridescens*, with which it has no analogy. Engelmann himself, however, later acknowledged (by letter) the error that he had committed. *E. Californicus* is much nearer *E. Emoryi*, but differs from it in its spines and flowers.

Having had occasion to study, at Paris, adult and authentic examples of *E. Californicus* raised from M. Dumesnil's seeds, and to see them flower, I give here the description:

Stem subglobular, somewhat glaucous, depressed; ribs 15-20, thick, obtuse, straight, swollen around the areolæ; grooves sharp; areolæ large, oval, distant, furnished with horny glands. Spines all strong, rounded, not flattened, lightly ringed, outer ones 7-9, straight, radiant, the upper 2-4, slender, yellowish, 3 cm. long, the five lower stouter, 4 cm. long, horny-yellow with purple spots arranged in transverse streaks or bands; centrals four, in form of a cross, of which the three upper are straight and similar to the lower radials, the lower (truly central) is the stoutest and longest of all (about 6 cm.), ringed, rounded, 2 mm. thick, recurved at summit, purple with a yellow point. Later all the spines are horny brown.

This description is drawn from an adult. The young seedlings have only eight spines, one of them central, all uncinatæ.

Flowers pure canary-yellow, 5 cm. long, 6 cm. expansion, springing from the tomentose summit of the plant. Ovary covered by about 24 imbricated, triangular-rounded, entire scales. Tube bearing a score of sepaloid scales gradually passing into the petals which are 40-45 in number, in 3 ranks, undulate on the margins and ending in a point. Stamens numerous and slender, the filaments deep carmine, anthers yellow. Style yellow, deeply divided into 16 erect stigmas.

Echinocactus acanthodes Lem. Under this name Lemaire described, in 1839, a species "Californian" raised from seeds by M. Courant of Havre, and well known for forty or fifty years after in French collections. It flowered at Monville in 1846. I have

had occasion to study a dead example preserved by Cels. This species is absolutely identical with that which Engelman described in 1852 under the name *E. cylindraceus* and which has been reintroduced in Belgium in recent years as *E. Leopoldi*.

It would serve no good purpose to reproduce here the description of this Echinocactus, today well known under the name given by Engelmann. It suffices to call attention to its synonymy and to show that Lemaire first made known this species characterized by its numerous and long spines, interwoven, recurved or flexuous. He called it *acanthodes*, because, said he, it is 'undique aculeis prægrandibus, confertissimis, maximeque intricatis, omnino horrens, unde nomen!'

SHORT ARTICLES.

ON THE OCCURRENCE OF RHAGADIOLUS HEDYPNOIS ALL. (HEDYPNOIS POLYMORPHIA DC.) IN NORTH AMERICA.

In the Proceedings of the American Academy of Arts and Sciences, vol. XVIII, p. 110, Dr. Watson lists the above species as one of the plants collected by Dr. Edward Palmer at Corpus Christi, Texas, September, 1879–October, 1880. Dr. B. L. Robinson, to whom I am indebted for the above information, writes that the species is also represented in the Gray Herbarium by a specimen collected by Hon. J. W. Congdon at Hornitos, Mariposa County, California, April, 1884. Dr. Palmer's plant was reported as a waif; that of Mr. Congdon as apparently naturalized, possibly native.

The attention of the writer was called to this species, heretofore unpublished, as from California, by finding it abundant and luxuriant near Altruria in Sonoma County, growing along the roadside, in the fields and near the flume that brings water to the Sanitarium. This was in April of the present year.

In De Candolle's Prodrômus, vol. VII, p. 81. *Hedypnois polymorpha* DC. is said to occur through the entire Mediterranean region in roughly cultivated and ploughed fields. The species is represented in the Herbarium of the California Academy of

Sciences by three specimens. One collected by J. Ball, near Florence, May 1848, another from the Herbarium of the Royal Museum of Florence, collected by Dr. Dukerly, near Algiers, April, 1863.

A brief description of this *Cichoriaceous* plant may serve to help others to identify what promises to be a new weed in California.

Hispid throughout, with slender, simple stems an inch or two high, to tall, widely branching plants, two or three feet high. Stem leaves ovate-lanceolate, sessile, clasping, entire or sinuately toothed: radical and lower stem leaves oblanceolate and, in luxuriant specimens, runcinately lobed, on long margined petioles clasping at base. Heads of yellow flowers from an eighth to half an inch in diameter, in naked peduncles an inch or more long: bracts of the involucre rigid, incurved, folding around the outermost akenes, muricately setose on the back, in a single series, spreading when old; outer akenes maturing, the pappus a crown of dentate scales; inner, abortive with acuminate, barbellate paleæ, almost equalling the akene; akenes barbellate-striate, terete; receptacle naked.

I have been told that where the Sanitarium now stands there was at one time a large garden worked by the Italians. It was doubtless through them that the weed was introduced.—*Alice Eastwood.*

PINUS LAMBERTIANA ON MT. ST. HELENA.

On a recent trip to the summit of Mt. St. Helena several trees of the above species were seen not far from the highest point on the eastern slope of the mountain. They were not large trees, perhaps forty or fifty feet high and from a foot to nearly two feet in diameter. Some of the trees bore cones, specimens of which were collected from among those that had fallen to the ground. Besides these trees there are others, that were pointed out to me by Mrs. Patton, growing on a ridge above the toll-house. While I could recognize the species from the distance, there was then no opportunity of visiting the locality to closely inspect the trees.

The trees near the summit of the mountain are not far from

the trail and can be distinctly seen from it. They are between the highest point and the iron stake which marks the meeting corners of Napa, Sonoma and Lake Counties.—*Alice Eastwood.*

ARCTOSTAPHYLOS AS A HOST PLANT FOR PHORADENDRON.

Recently a specimen of *Phoradendron flavescens* Nutt, var. growing on *Arctostaphylos viscida* Parry, was brought to the Herbarium of the California Academy of Sciences. It was collected in the foot-hills east of Marysville. As far as I am aware, this is the first record of mistletoe parasitic on manzanita, or indeed on any of the *Ericaceæ*. Apparently this *Phoradendron* takes the liberties accorded in a free country and grows on whatever it pleases.—*Alice Eastwood.*

Scorzonera Hispanica L. has become naturalized around Calistoga and in Knight's Valley. It can be found along the roadside, growing where the ground is wet. This has undoubtedly escaped from cultivation, as it is sometimes cultivated for its roots, which are eaten as those of *Tragopon* or salsify. It is commonly called Viper's Grass, and was formerly used in Spain for the cure of serpent's bites. The foliage is glabrous and glaucous, the heads of flowers yellow, two inches in diameter, the buds are nodding on long curved peduncles. The plants seen were two feet or more in height.—*Alice Eastwood.*

RECENT LITERATURE.

Contributions to a knowledge of the Morphology and Ecology of the Cactaceæ: II. The Comparative Morphology of the Embryos and Seedlings. W. F. GANONG, *Annals of Botany*, XII., 423-474, Pl. xxvi.

This is an important contribution to the more exact and scientific study of the Cactaceæ. The embryos and young plants of 50 species have been studied, compared and figured. It is much to be regretted that the seeds were not figured on the same plate.

The conclusions reached from the studies are in most cases confirmatory of the relationships as usually received.

Some trivial errors are to be noticed, such as the misprinting of *Cereus nycticalus* as "*C. nycticaulis*," and the reference to *Echinocereus tuberosus* as the type of the slender creeping forms of the genus.

Cyclopedia of American Horticulture, comprising suggestions for cultivation of horticultural plants, descriptions of the species of fruits, vegetables, flowers and ornamental plants sold in the United States and Canada, together with geographical and biographical sketches, by L. H. BAILEY, Professor of Horticulture in Cornell University, assisted by WILHELM MILLER, associate editor, and many others. In four volumes. Illustrated with over 2,000 original engravings. Vol. I. A-D., 4-to, pp. 409. The Macmillan Company, New York. 1900. \$5.00.

This book marks a distinct advance, in that it not only embodies all the most recent horticultural methods and important additions to the number of plants in the trade, and by its great wealth of illustration brings so much of its work to the knowledge of readers in the easiest possible way, but because being prepared under the constant editorial supervision of competent botanists, and many of its articles written by botanical authorities, its nomenclature is so much more satisfactory. Of how much importance stable names are to the trade, botanists as a rule have small conception. The practice of the editor in this matter is marked by a wise conservatism, as is best shown by a few excerpts from his explanations:

"The Editor has desired to be conservative on the vexed question of nomenclature. This effort is particularly important in the discussion of cultivated plants, because names become established in the trade and are worth money. A plant sells under a familiar name, but it may be a commercial failure under a new or strange one. Since plants belong as much to the horticulturist as to the botanist, it is only fair that the horticulturist be consulted before wholesale changes are made in nomenclature.

It is well to bear in mind that changes in the names of plants

proceed from two general causes: (1) from new conceptions respecting the limits of genera, species, varieties, and (2) from new ideas in the merely arbitrary fashions or systems of nomenclature. Changes of the former kind are usually welcomed by horticulturists, because they elucidate our understanding of the plants; but changes of the latter kind are usually deplored. At the present time there is the greatest unrest in respect to systems of nomenclature. This unrest is, to be sure, in the interest of the fixity or permanency of names, but there is no guarantee—if, indeed, there is any hope—that the system which may be adopted today will be accepted by the next generation. In fact, the very difficulty of arriving at a common understanding on the question is itself the strongest evidence that the systems do not rest on fundamental or essential principles, but upon expediency and personal preference. There is no evidence that names which are making today will persist any longer than have those which they are supplanting.

So-called reforms in nomenclature are largely national or racial movements, often differing widely between different peoples; consequently it is impossible to bring together under one system of nomenclature the cultivated plants of the world without making wholesale changes in names. Therefore, the editor has accepted the most tenable names which the plants bring, without inquiring into the system under which they are given. In general, however, he believes that the technical name of a plant is comprised of two words, and that the first combination of these two parts should be accepted as the name. Such double names as *Catalpa Catalpa* and *Glaucium Glaucium* are the results of carrying arbitrary rules to the utmost limit, but their ugliness and arbitrariness condemn them. It is to be expected that in the names of plants, as in everything else, the race will not long tolerate inflexibility."

The regional articles with maps are of more than ordinary interest, though the "California" notice is somewhat of a disappointment as compared to some others, being prepared almost entirely from the standpoint of the fruit-grower.

NOTES AND NEWS.

Prof. W. A. Setchell is spending his vacation in studying the flora of the Hawaiian Islands.

Prof. J. W. Tuomey of the University of Arizona has been appointed Assistant Professor of Forestry at Yale. The courses offered by him will be Forest Botany, Outlines of Forestry, Forest Planting and Sowing, Forest Technology, Lumbering and Forest Protection. Prof. Tuomey has many friends in the west, who are loth to spare him, even for his own advancement.

Prof. F. H. Hildman of the Agricultural College of Nevada has resigned the Chair of Botany in that institution. His loss is likely to be severely felt.

Miss Susan G. Stokes of the Salt Lake High School is spending her vacation with her parents at Chollas Valley, San Diego. The monograph of the large genus *Eriogonum* on which she has been engaged for several years is approaching completion.

Dr. Edward Palmer is engaged at Washington, in arranging the mass of notes connected with his many years of botanical collecting.

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